

Claims

1. Process for the preparation of 5,5-diphenyl-3-[(phosphonooxy)methyl]-imidazolidine-2,4-dione disodium salt, characterized in that 3-hydroxymethyl-5,5-diphenylimidazoline-2,4-dione is reacted with a phosphorous acid diester or triester activated by an oxidizing agent, whose ester groups can be selectively cleaved from the reaction product, the ester groups are cleaved from the resulting phosphoric acid diester 2,5-dioxo-4,4-diphenylimidazolidin-1-ylmethyl ester and the resulting 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione is converted to its disodium salt.
2. Process according to Claim 1, characterized in that the oxidizing agent is a halogenating agent.
3. Process according to Claim 2, characterized in that the halogenating agent is elemental bromine, N-bromosuccinimide, 1,3-dibromo-5,5-dimethylhydantoin, carbon tetrabromide, trichlorobromomethane, elemental chlorine, N-chlorosuccinimide, trichloroisocyanuric acid or hexachloroacetone.
4. Process according to one of Claims 1 to 3, characterized in that the ester groups can be cleaved under mild acidic conditions, oxidatively, photochemically, under mild basic conditions or by hydrogenolysis.
5. Process according to Claim 4, characterized in that the phosphorous acid ester is ditert-butyl phosphite, dibenzyl phosphite, bis-4-methoxybenzyl phosphite, bis-4-bromobenzyl phosphite, bis-4-nitrobenzyl phosphite, bis(2,4-dimethoxybenzyl) phosphite, bis-2,2,2-trichloroethyl phosphite, bis(2-trimethylsilylethyl) phosphite, triallyl phosphite or tribenzyl phosphite, or dimethyl phosphite, diethyl phosphite, trimethyl phosphite or triethyl phosphite.
6. Process according to Claim 1, characterized in that 3-hydroxymethyl-5,5-diphenylimidazoline-2,4-dione is reacted with dibenzyl phosphite activated by elemental bromine or N-bromosuccinimide, the resulting phosphoric acid 2,5-dioxo-4,4-diphenylimidazolidin-1-ylmethyl dibenzyl ester is hydrogenated and the resulting 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione is

converted to its disodium salt with sodium carbonate.

7. Process according to Claim 6, characterized in that the hydrogenation takes place in the presence of palladium-on-active charcoal.

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8. Process according to Claim 6 or 7, characterized in that on the one hand the activation of the dibenzyl phosphite with elemental bromine or N-bromosuccinimide and the reaction of the activation product with 3-hydroxymethyl-5,5-diphenylimidazoline-2,4-dione, and on the other hand the
10 hydrogenation of the phosphoric acid 2,5-dioxo-4,4-diphenylimidazolidin-1-ylmethyl dibenzyl ester and the conversion of the 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione to its disodium salt, are each carried out in one operation.

15 9. Process according to Claim 8, characterized in that the activation of the dibenzyl phosphite with elemental bromine or N-bromosuccinimide and the reaction of the activation product with 3-hydroxymethyl-5,5-diphenylimidazoline-2,4-dione are carried out in a mixture of acetonitrile and pyridine, and the
20 hydrogenation of the phosphoric acid 2,5-dioxo-4,4-diphenylimidazolidin-1-ylmethyl dibenzyl ester and the conversion of the 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione to its disodium salt are carried out in a mixture of methanol, water and an acetic acid/sodium acetate buffer.

10. Process for the preparation of 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione disodium salt, characterized in that, in a single operation, a
25 phosphoric acid diester 2,5-dioxo-4,4-diphenylimidazolidin-1-ylmethyl ester, whose phosphoric acid diester structural element can be selectively cleaved, is converted to 5,5-diphenyl-3-[(phosphonooxy)methyl]imidazolidine-2,4-dione and the latter is converted to its disodium salt.